Appl. No. 10/718,231

Amdt. Dated May 9, 2005

Reply to Office Action of February 7, 2005

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in this application.

1. (Currently Amended) An automatic tracking apparatus for a reflector, comprising:

a surveying machine body;

an illumination portion disposed in said surveying machine body for illuminating a measurement light toward a reflector;

a light receiving portion which is disposed in said surveying machine body and which has an image sensor including a plurality of pixels for receiving a reflection light image of the measurement light illuminated toward said reflector;

an arithmetic ~~means for calculating~~ device configured to calculate a position of the reflection light image from said reflector in an area of said image sensor; ~~and~~

a rotation mechanism for rotating said surveying machine body so as to position said reflector on a light receiving optical axis of said light receiving portion based on the position obtained by said arithmetic ~~means,~~ device; and

a distance measuring portion for measuring a distance from the reflector to the surveying machine body.

wherein the area of the image sensor is provided with a first light receiving area, which is set to be larger than the reflection light image, ~~having said light receiving optical axis as a center,~~ and a second light receiving area surrounding the first light receiving area, as scanning areas of the reflection light image, and

areas of the first light receiving area and the second light receiving area are changed in accordance with the distance from the reflector to the surveying machine body.

2-3. (Cancelled).

4. (Currently Amended) ~~The~~ An automatic tracking apparatus for a reflector ~~according to Claim 1,~~ comprising:

a surveying machine body;

an illumination portion disposed in said surveying machine body for illuminating a measurement light toward a reflector;

a light receiving portion which is disposed in said surveying machine body and which has an image sensor for receiving a reflection light image of the measurement light illuminated toward said reflector;

an arithmetic device configured to calculate a position of the reflection light image from said reflector in an area of said image sensor; and

a rotation mechanism for rotating said surveying machine body so as to position said reflector on a light receiving optical axis of said light receiving portion based on the position obtained by said arithmetic device.

wherein the area of the image sensor is provided with a first light receiving area, which is set to be larger than the reflection light image, having said light receiving optical axis of the light receiving portion as a center, and a second light receiving area surrounding the first light receiving area, and

~~wherein~~ an area of the second light receiving area is set by judging a distance from a size of the reflection light image.

5. (Previously Presented) The automatic tracking apparatus for a reflector according to Claim 1, wherein a range of said second light receiving area is set within a range of a rotation angle in a horizontal direction and a rotation angle in a vertical direction rotated by said rotation mechanism within a scanning time for one field of said image sensor.

6. (Currently Amended) The automatic tracking apparatus for a reflector according to Claim 1, wherein said arithmetic ~~means~~ device comprises a storing portion for storing a position of said reflection light image and a position of a light image other than said reflection light image, and when the light image other than said reflection light image exists in said second light receiving area, said arithmetic ~~means~~ device distinguishes between the position of said reflection light image and the position of the light image other than said reflection light image.

7. (Currently Amended) The automatic tracking apparatus for a reflector according to Claim 6, wherein said storing portion stores a size and a shape of said reflection light image, and said arithmetic ~~means~~ device specifies the reflector based on the size and the shape of said reflection light image as well as said position.

8. (New) The automatic tracking apparatus for a reflector according to Claim 4, wherein said arithmetic device comprises a storing portion for storing a position of said reflection light image and a position of a light image other than said reflection light image, and when the light image other than said reflection light image exists in said second light receiving area, said arithmetic device distinguishes between the position of said reflection light image and the position of the light image other than said reflection light image.

9. (New) The automatic tracking apparatus for a reflector according to Claim 8, wherein said storing portion stores a size and a shape of said reflection light image, and said arithmetic device specifies the reflector based on the size and the shape of said reflection light image as well as said position.